

CORRESPONDENCE**Letters to the Editor**

The Relationship Between Pre-Participation Screening of Young Competitive Athletes and Family Screening

With great interest we read the review by Corrado et al. (1) on pre-participation screening (PPS) of young competitive athletes to prevent sudden cardiac death (SCD).

It is important that Corrado et al. (1) briefly mentioned the possibility of cascade screening of relatives of a competitive athlete with an inherited heart disease. Unfortunately, this topic is frequently neglected in articles on PPS. As the authors state, identifying other affected family members with subsequent high-risk stratification and treatment can save additional lives.

Hypertrophic cardiomyopathy (HCM), which can be detected by PPS (1), is the most important cause of SCD in young athletes. At present, a mutation is identified in 30% to 61% of HCM patients (2). The identification of a disease causing mutation enables cascade screening within a family. With the developments in diagnostic tools for DNA analysis (e.g., high-throughput techniques), the proportion of mutations identified will probably increase. In case no mutation is found (yet) in an HCM patient, cardiological examination of first-degree relatives is the second best option.

One could argue that affected family members identified by cascade screening should be taken more into account when discussing the efficacy of PPS. In any case, performing cascade screening after identification of an affected athlete by PPS could contribute to reducing the incidence of SCD in the general population.

Moreover, implementing and offering an adequate nationwide family screening program to relatives of young SCD victims or patients with inherited heart disease could identify most individuals and families in the country at risk of SCD. This would potentially decrease the benefit of PPS in competitive athletes, because this target group would become an even more selected healthy population.

Christian van der Werf, MD
Irene M. van Langen, MD, PhD
***Arthur A. M. Wilde, MD, PhD**

*Academic Medical Center
University of Amsterdam
Heart Failure Research Center
Department of Cardiology
Meibergdreef 9
1105 AZ Amsterdam
the Netherlands
E-mail: a.a.wilde@amc.uva.nl

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Reply

We appreciate the interest of Dr. van der Werf and colleagues in our review (1). Their comments provide an opportunity to further clarify some aspects concerning appropriate strategies for sudden death prevention. The majority of conditions carrying risk of arrhythmic cardiac arrest in young people and athletes are genetically determined diseases with an autosomal dominant pattern of inheritance. Universal evaluation of the general population for inherited heart diseases is not currently feasible, because of the prohibitive costs and the limited diagnostic accuracy of both clinical and genetic evaluation. A reasonable alternative strategy is to target high-risk subgroups (1,2). Patients with cardiac symptoms, such as syncope or pre-syncope, are the first group that needs accurate cardiologic assessment. However, most inherited cardiomyopathies (including ion channel diseases) show a silent clinical course that might lead to arrhythmic cardiac arrest in the absence of warning disabling symptoms and ventricular dysfunction (1,3). Because the individuals at risk are unlikely to be identified on the basis of spontaneous symptoms, strategies for prevention of sudden death rely on programs of actively searching for high-risk subjects. These prevention strategies include: 1) pre-participation screening of competitive athletes who show a 3-fold increase of the relative risk of sudden cardiac death compared with their nonathletic counterparts; and 2) cascade screening of relatives of sudden cardiac death victims or probands with a inherited heart disease, who have a 50% chance of inheriting the gene defect and the potentially malignant clinical phenotype. The current evidence is that pre-participation electrocardiographic evaluation of young competitive athletes is effective in identifying athletes with potentially lethal cardiovascular disease and actually saves lives, although no data on the efficacy of clinical cascade screening for sudden death prevention are available. At the present time, systematic molecular genetic screening for inherited heart diseases is impractical because it is time-consuming, costly, and—particularly—lacks accuracy given that many disease-causing genes remain to be discovered. Instead, a selective genetic screening of family members of a proband who has been identified with a causative mutation is feasible and offers clear advantages over clinical screening. Genotyping facilitates cascade screening, because it allows for definitive reassurance of true gene-negative family members and focuses prevention strategies on proven gene-carriers. Clinical manifestations of inherited heart diseases are usually preceded by a long “pre-clinical” phase, and cardiac arrest often occurs in previously asymptomatic young adults and com-